## REMARKS

### Status of Application

Claims 19-43 are pending in the application; the status of the claims is as follows:

Claims 19, 21, and 34-43 are rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,258,694 to Ohnishi et al. ("Ohnishi") in view of U.S. Patent No. 5,870,634 to Sugaya et al. ("Sugaya").

Claims 20, 22, and 23 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Ohnishi in view of U.S. Patent No. 6,812,618 B2 to Hayashi et al. ("Hayashi").

Claim 24 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Ohnishi in view of U.S. Patent No. 6,437,481 B2 to Senda et al. ("Senda").

Claims 25-33 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Ohnishi, Sugaya and Hayashi as applied above, and further in view of U.S. Patent No. 6,512,321 B2 to Yoshida et al. ("Yoshida").

### 35 U.S.C. § 103(a) Rejections

The rejection of claims 19, 21, and 34-43 under 35 U.S.C. § 103(a), as being unpatentable over Ohnishi in view of Sugaya, is respectfully traversed based on the following.

Ohnishi shows a control device for an ultrasonic motor. The ultrasonic motor includes two legs 1 and 2, on which two piezoelectric elements 6 and 7 are mounted. A driving circuit 16 drives the piezoelectric elements according to control signals provided by AND gates 12 and 14. A fixed oscillator 11 provides a constant frequency signal at the resonance frequency of the motor (col. 2, lines 50-51). The output of the oscillator is

provided directly to AND gate 12. The constant frequency is phase shifted by phase shifter 13 and provided to AND gate 14.

The other input CP of AND gates 12 and 14 is provided by CPU 15. A target value of the movement of the motor is input by target value inputting means 19 to CPU 15. This is used to set N-bit down counter 18 with a count in accordance with the selected movement. A linear sensor 17 detects movement of the motor and provides pulses to the N-bit down counter. These pulses decrement the stored count, which provide an indication to CPU 15 of the progress of movement toward the target (col. 3, lines 4-15 and 41-49). When the motor reaches a predetermined slow down point, signal CP is altered to lower the duty ratio of the driving signals output from AND gates 12 and 14, thus slowing the motor. When the N-bit down counter reaches a count of zero, the duty ratio is set to zero, thus stopping the motor at the intended target (col. 4, lines 8-12).

Sugaya shows an anti-blur mechanism for a camera. A vibration motor 10 is used to counteract vibration to the camera. The position and angular velocity (col. 10, lines 67 – col. 11, line 4) are determined and processed (Figure 10) to determine the commands (col. 11, lines 11-15) for the vibration motor to counteract the vibration. As noted at col. 10, line 65 – col. 11, line 18:

> FIG. 10 is a block diagram of a control circuit of the image blur suppression device in accordance with the first preferred embodiment of the present invention. The optical axis Z position of the image blur suppression optical system 30 is detected by the light projectors 43a and 43b, the light receivers 44a and 44b, (comprising a lens position detection sensor 110) and a lens position detection circuit 45. The optical axis z position of the image blur suppression optical system 30 is compared, in a compensation circuit 48 with information obtained from an angular velocity sensor 46, which detects vibrations of the image blur suppression device in the main camera body, and from information obtained by an amount of camera shake detection circuit 47. Image blur is prevented by: outputting from the USM driver 49 movement axis command signals which specify either the X direction or Y direction along with movement direction forward or backward command signals to specify the direction of movements to a vibration motor 10. Subsequent feedback is used to control

> the movement of the image blur suppression optical system 30 so as to correspond to the image blur produced by camera shake.

Therefore, Sugaya uses position and angular velocity data to determine a direction of movement driving signal that is output by USM driver 49. The movement is controlled by feedback signals.

In contrast to the cited references, claim 19 includes:

> a position detector which detects a present position of the movable member driven by the ultrasonic actuator;
> a calculator which calculates a control target position of the movable member;
> a driver which generates a drive signal to drive the ultrasonic actuator in a specified resonant state; and
> a position servo controller which sets a basic driving frequency of the drive signal and controls said non-frequency parameter of the drive signal based on a difference between the present position and the control target position so that the movable member pursues the control target position.

Ohnishi shows a fixed frequency oscillator 11 that is not subject to any controller. Sugaya does not show the operation of an oscillator. Therefore, the cited references do not show or suggest "a position servo controller which sets a basic driving frequency of the drive signal." In addition, the Office Action states beginning at the last line of page 2 that:

> Sugaya discloses a camera shake correction system that uses an angular velocity sensor to determine the amount of camera shake and finds the difference from the detected position of the shake compensation lens to drive the ultrasonic motor displacing the lens to a desired target position in Fig. 10.

Applicants respectfully submit that this overstates the disclosure of Sugaya. Sugaya states that the Z position is compared to angular velocity data and camera shake data to determine a control signal causing the vibration motor 10 to move in a specified direction (col. 11, lines 4-15). There is nothing in Sugaya to suggest that there is a target position, much less a calculation to determine that target position. Ohnishi shows a linear

sensor 17 that can only detect movement, but not position. Therefore, the cited references do not show or suggest "a calculator which calculates a control target position of the movable member" or "a position servo controller which ... controls said non-frequency parameter of the drive signal based on a difference between the present position and the control target position so that the movable member pursues the control target position." To support a *prima facie* case for obviousness, the cited references, alone or in combination, must show or suggest every limitation of the claim. MPEP §2143.03. Therefore, the cited references do not support a *prima facie* case for obviousness of claim 19. Claim 21 is dependent upon claim 19, and thus includes every limitation of claim 19. Therefore, claim 21 is also not obvious over the cited references.

Also in contrast to the cited references, claim 34 includes:

> a position detector which detects a present position of the movable member driven by the ultrasonic actuator;
> a calculator which calculates a control target position of the movable member;
> a driver which generates a drive signal to drive the ultrasonic actuator in the specified resonant state; and
> a position servo controller which sets a basic driving frequency of the drive signal and controls said non-frequency parameter of the drive signal based on a difference between the present position and the control target position so that the movable member pursues the control target position, wherein a frequency of the drive signal is maintained within a predetermined frequency range.

As noted above with regard to claim 19, the cited references do not show or suggest "a calculator which calculates a control target position" or "a position servo controller which sets a basic driving frequency of the drive signal." Therefore, the cited references do not support a *prima facie* case for obviousness of claim 34. Claims 35-37 are dependent upon claim 34, and thus include every limitation of claim 34. Therefore, claims 35-37 are also not obvious over the cited references.

Also in contrast to the cited references, claim 38 includes:

> a position detector which detects a present position of the movable member driven by the ultrasonic actuator;
> a calculator which calculates a control target position of the movable member;
> a driver which generates the drive signal to drive the ultrasonic actuator in a specified resonant state; and
> a position servo controller which sets a basic driving frequency of the drive signal and controls a non-frequency parameter of the drive signal based on a difference between the present position and the control target position so that the movable member pursues the control target position.

As noted above with regard to claim 19, the cited references do not show or suggest "a calculator which calculates a control target position" or "a position servo controller which sets a basic driving frequency of the drive signal." Therefore, the cited references do not support a *prima facie* case for obviousness of claim 38. Claims 39-41 are dependent upon claim 38, and thus include every limitation of claim 38. Therefore, claims 39-41 are also not obvious over the cited references.

Also in contrast to the cited references, claim 42 includes:

> a position detector which detects a present position of the movable member driven by the ultrasonic actuator;
> a calculator which calculates a control target position of the movable member;
> a driver which generates the drive signal to drive the ultrasonic actuator in a specified resonant state; and
> a position servo controller which sets a basic driving frequency of the drive signal and controls a non-frequency parameter of the drive signal based on a difference between the present position and the control target position so that the movable member pursues the control target position.

As noted above with regard to claim 19, the cited references do not show or suggest "a calculator which calculates a control target position" or "a position servo controller which sets a basic driving frequency of the drive signal." Therefore, the cited references do not support a *prima facie* case for obviousness of claim 42. Claim 43 is dependent upon claim 42, and thus includes every limitation of claim 42. Therefore, claim 43 is also not obvious over the cited references.

Accordingly, it is respectfully requested that the rejection of claims 19, 21, and 34-43 under 35 U.S.C. § 103(a) as being unpatentable over Ohnishi in view of Sugaya, be reconsidered and withdrawn.

The rejection of claims 20, 22, and 23 under 35 U.S.C. § 103(a), as being unpatentable over Ohnishi in view of Hayashi, is respectfully traversed based on the following.

Hayashi shows a control apparatus for a vibration type actuator. A target position is entered into a position control block 2 (Figure 1). The position control block also receives a signal p indicating a relative position determined by position counter 5. A frequency command corresponding to a selected speed is issued by a speed control block 3. For each selected frequency, a corresponding optimal pulse width PW is stored in a table in memory. This optimal pulse width is used to optimize the speed vs. frequency characteristics of the device (col. 4, line 65 – col. 5, line 11).

As noted above, claim 19 includes:

> a position detector which detects a present position of the movable member driven by the ultrasonic actuator;
> a calculator which calculates a control target position of the movable member;
> a driver which generates a drive signal to drive the ultrasonic actuator in a specified resonant state; and
> a position servo controller which sets a basic driving frequency of the drive signal and controls said non-frequency parameter of the drive signal based on a difference between the present position and the control target position so that the movable member pursues the control target position.

In both Ohnishi and Hayashi, the target position is entered externally. Therefore, neither reference shows or suggests "a calculator which calculates a control target position." In addition, in Ohnishi, the output of oscillator 11 is fixed. In Hayashi, the control of the speed is determined primarily by frequency (Figures 4, 6 and 7). Thus,

neither reference shows or suggests "a position servo controller which sets a basic driving frequency of the drive signal and controls said non-frequency parameter of the drive signal based on a difference between the present position and the control target position so that the movable member pursues the control target position." Claims 20, 22 and 23 are dependent upon claim 19, and thus include every limitation of claim 19. Because the combined references do not show or suggest every limitation of claims 20, 22 and 23, the cited references do not support a *prima facie* case for obviousness of claims 20, 22 and 23.

Accordingly, it is respectfully requested that the rejection of claims 20, 22, and 23 under 35 U.S.C. § 103(a) as being unpatentable over Ohnishi in view of Hayashi, be reconsidered and withdrawn.

The rejection of claim 24 under 35 U.S.C. § 103(a), as being unpatentable over Ohnishi in view of Senda, is respectfully traversed based on the following.

Senda shows that the speed to frequency response of a piezoelectric device varies with temperature (Figure 2), and shows a mechanism is shown for compensating for this temperature variation (col. 6, lines 9-16).

As noted above with regard to claim 19, Ohnishi does not show or suggest "a calculator which calculates a control target position" or "a position servo controller which sets a basic driving frequency of the drive signal." Senda also does not show or suggest these missing limitations. Claim 24 is dependent on claim 19 and thus includes every limitation of claim 19. Therefore, the cited references in combination do not show or suggest every limitation of claim 24 and do not support a *prima facie* case for obviousness of claim 24.

Accordingly, it is respectfully requested that the rejection of claim 24 under 35 U.S.C. § 103(a) as being unpatentable over Ohnishi in view of Senda, be reconsidered and withdrawn.

The rejection of claims 25-33 under 35 U.S.C. § 103(a), as being unpatentable over Ohnishi, Sugaya and Hayashi, and further in view of Yoshida, is respectfully traversed based on the following.

Yoshida shows an ultrasonic piezoelectric motor (Figure 2) similar to that shown in Figure 2 of this application. The driving frequency fd is set at a frequency lower than the resonant frequency of the motor (*e.g.* col. 7, lines 6-10).

As noted above, claim 19 includes:

> a position detector which detects a present position of the movable member driven by the ultrasonic actuator;
> a calculator which calculates a control target position of the movable member;
> a driver which generates a drive signal to drive the ultrasonic actuator in a specified resonant state; and
> a position servo controller which sets a basic driving frequency of the drive signal and controls said non-frequency parameter of the drive signal based on a difference between the present position and the control target position so that the movable member pursues the control target position.

In both Ohnishi and Hayashi, the target position is entered externally. In Sugaya, there is no discussion of determining a target position. Therefore, none of these references shows or suggests "a calculator which calculates a control target position." In addition, in Ohnishi, the output of oscillator 11 is fixed. In Hayashi, the control of the speed is determined primarily by frequency (Figures 4, 6 and 7). Sugaya does not specify the exact parameters that are applied to the motor. Thus, none of these references shows or suggests "a position servo controller which sets a basic driving frequency of the drive signal and controls said non-frequency parameter of the drive signal based on a difference between the present position and the control target position so that the movable member pursues the control target position." Yoshida also does not show or suggest these limitations. Claims 25-27 are dependent upon claim 19, and thus include every limitation of claim 19.

Because the combined references do not show or suggest every limitation of claims 25-27, the cited references do not support a *prima facie* case for obviousness of claims 25-27.

Also in contrast to the cited references, claim 28 includes:

> a position detector which detects a present position of the movable member driven by the ultrasonic actuator;
> a calculator which calculates a control target position of the movable member;
> a driver which generates a drive signal to drive the ultrasonic actuator in a specified resonant state; and
> a position servo controller which sets a frequency of the drive signal to a frequency lower than a complete resonant frequency of the ultrasonic actuator, and which controls a first non-frequency parameter of the drive signal based on a difference between the present position and the control target position so that the movable member pursues the control target position.

As noted above, the cited references, alone or in combination, do not show or suggest "a calculator which calculates a control target position" or "a position servo controller which sets a basic driving frequency of the drive signal ... and, which controls said non-frequency parameter of the drive signal based on a difference between the present position and the control target position so that the movable member pursues the control target position." Therefore, the cited references do not support a *prima facie* case for obviousness of claim 28. Claims 29-33 are dependent upon claim 28, and thus include every limitation of claim 28. Because the combined references do not show or suggest every limitation of claims 29-33, the cited references do not support a *prima facie* case for obviousness of claims 29-33.

Accordingly, it is respectfully requested that the rejection of claims 25-33 under 35 U.S.C. § 103(a) as being unpatentable over the references as applied in numbered paragraphs 2 and 3 above, and further in view of Yoshida, be reconsidered and withdrawn.

## CONCLUSION

Wherefore, in view of the foregoing remarks, this application is considered to be in condition for allowance, and an early reconsideration and a Notice of Allowance are earnestly solicited.

This Response does not increase the number of independent claims, does not increase the total number of claims, and does not present any multiple dependency claims. Accordingly, no fee based on the number or type of claims is currently due. However, if a fee, other than the issue fee, is due, please charge this fee to Sidley Austin Brown & Wood LLP's Deposit Account No. 18-1260.

If an extension of time is required to enable this document to be timely filed and there is no separate Petition for Extension of Time filed herewith, this document is to be construed as also constituting a Petition for Extension of Time Under 37 C.F.R. § 1.136(a) for a period of time sufficient to enable this document to be timely filed.

Any other fee required for such Petition for Extension of Time and any other fee required by this document pursuant to 37 C.F.R. §§ 1.16 and 1.17, other than the issue fee,

and not submitted herewith should be charged to Sidley Austin Brown & Wood LLP's Deposit Account No. 18-1260. Any refund should be credited to the same account.

Respectfully submitted,

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